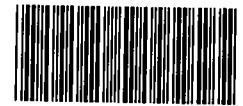


# TRIP REPORT



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12<sup>th</sup> Street Landfill Site  
Wilmington, New Castle Co., Delaware

TDD No. 9907-03A  
Contract No. 68-S5-3002

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## 1.0 INTRODUCTION

On 8 July 1999, the Roy F. Weston, Inc. (WESTON®), Site Assessment Technical Assistance (SATA) team was directed by U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) Mike Towle to conduct a removal assessment at the 12<sup>th</sup> Street Landfill Site (Site) located in Wilmington, New Castle County, Delaware.

## 2.0 BACKGROUND

### 2.1 Location

The Site is located in Wilmington, New Castle County, Delaware, as seen in Figure 1, Site Location Map (Reference 1). The approximate site coordinates are 39° 44' 15" north latitude and 75° 31' 35" west longitude (Reference 2).

### 2.2 Site Description

The 12<sup>th</sup> Street Landfill Site is located in an industrial area on 12<sup>th</sup> Street, west of the Interstate-495 12<sup>th</sup> Street ramp, near Gander Hill Prison in Wilmington, New Castle County, Delaware. The Site consists of two land parcels. Parcel 19 (which contains the area of concern) is bordered to the west by Brandywine Creek, to the north by Asset Recovery Services, and to the east and south by state of Delaware owned land (parcel 14). Parcel 14 is bordered to the north by Gander Hill Prison, to the northeast by a Norfolk & Southern railroad yard, to the east and southeast by Norfolk & Southern railroad tracks (Shellpot Branch), and to the west by the Brandywine Creek and parcel 19 (see Figure 2, Site Plan) (Reference 3).

Julius Wemman previously owned parcel 19 until 1926. Between 1926 and 1930 the parcel was owned by the mayor and council of Wilmington. The Wilmington Economic Development Corporation owned the parcel from 1930 to 1987. This parcel is presently owned by the city of Wilmington. George W. Talley previously owned parcel 14 until 1887. Between 1887 and 1971, the parcel was owned by the Philadelphia, Baltimore, and Washington Rail Road Company. This parcel is presently owned by the state of Delaware Department of Transportation. There is no information on what the parcels were utilized for during previous ownerships. Apparently, the area of concern (AOC) was utilized as an unauthorized dump site, in which at least 14 55-gallon drums, rubber hoses, slag, and a light colored ash-like material were disposed of on the property (Reference 3). The company suspected of dumping, Electric Hose and Rubber, operated out of the Brandywine Industrial Complex located adjacent to the Site and ceased operations in 1977 (Reference 4).

The Site is relatively flat, with an average elevation of approximately 10 feet above sea level. The AOC is bounded to the west by the Brandywine Creek, which flows into the Christina River downstream of the Site. The Brandywine Creek has its headwater in the Piedmont Plateau in Pennsylvania, which defines the border between Chester County and Delaware County in Pennsylvania and

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enters Delaware just north of Beaver Valley. The creek meanders through Wilmington until it joins the Christina River which then joins the Delaware River southeast of Wilmington (Reference 5).

The water supply for the Wilmington area is obtained from a surface water intake located 4,800 feet upstream of the Site along the Brandywine Creek (Reference 6).

During the removal assessment, both parcels were covered with thick vegetation consisting of tall phragmites and deciduous trees. Two drum cluster areas were identified. One drum cluster area is located in the northwestern area of parcel 19 adjacent to the Brandywine Creek (northwest side of the AOC). The second drum cluster area is located in the center of parcel 19 (southern side of the AOC).

## 2.2 Geologic Setting

*The Geology of the Wilmington Area, Delaware Geologic Map Series Number 4* geologic map prepared by the Delaware Geologic Survey indicates that the 12<sup>th</sup> Street Landfill Site is located on the border of the Piedmont Physiographic Province and the Atlantic Coastal Plain. The contact, referred to as the fall line, is located approximately 2,000 feet north of the 12<sup>th</sup> Street Landfill Site (Reference 5).

The bedrock at the Site consists of metaigneous and metasedimentary rocks of the Wilmington Complex. The composition is primarily hypersthene-quartz-andesine gneiss with minor amounts of biotite and magnetite. Regolith overlying the bedrock of the area reportedly varies from 0-20 feet (Reference 5).

The unconsolidated aquifer overlying the bedrock generally forms at the base of the regolith, directly above the unweathered bedrock. The aquifer typically acts as an unconfined aquifer. The piedmont aquifers are complex and unpredictable due to the variability of fractures. The rock units of the Piedmont are relatively impermeable, except where weathering or fracturing has taken place (Reference 5).

Due to the variability of the regolith thickness and its limited vertical extent in the vicinity of the site, water yields are expected to be low. Groundwater at the Site is tidal influenced. The tide level for this area fluctuates 6.5 feet between low tide and high tide (Reference 7). During the removal assessment, water levels in the test pits ranged between approximately 7 to 8 feet below ground surface (bgs) in the central and southern sections of the AOC to approximately 13 feet bgs in the northwestern section of the AOC. One test pit (18 feet deep) in the northern section of the AOC did not encounter any groundwater.

There are no public supply or private home wells that are used for either domestic or potable purposes located within four miles of the Site (Reference 6).

## 2.3 Climatic Setting

The annual average temperature in Wilmington is 54.6°F. The average monthly temperatures range from 35°F in January to 76°F in July. The average annual precipitation for Wilmington is 44.38 inches. The average monthly precipitation

ranges from 2.72 inches in February to 5.34 inches in August. The mean annual lake evaporation for the area of the site is approximately 35 inches. The net annual precipitation for the site is approximately 9.38 inches. A two-year, 24-hour rainfall will produce approximately 3.3 inches of rain (Reference 8).

## 2.4 Regulatory History

On 14, 15, and 16 June 1999, Delaware Department of Natural Resources and Environmental Control (DNREC) personnel conducted a site visit as part of a Brownfields Site Assessment Investigation for the eastern side of the Brandywine Creek, along 12<sup>th</sup> Street. During the same time as the site visit, DNREC collected surface soil samples on the Site. On 7 July 1999, DNREC updated city officials on their findings (Reference 4).

In July 1999, the EPA was notified by DNREC to investigate what appeared to be drums containing hazardous materials at the Site.

In late August and early September 1999, OSC Towle began conducting a removal assessment of the property to determine if further federal actions were warranted at the 12<sup>th</sup> Street Landfill Site.

## 3.0 SITE ACTIVITIES

Between 26 August and 2 September 1999, a removal assessment was conducted at the 12<sup>th</sup> Street Landfill Site. Six surface soil samples (including a duplicate) were collected from the AOC, located on parcel 19. Three subsurface soil samples were collected from test pits excavated within the AOC. A groundwater sample was also collected from one test pit (TS-TP-03). Two sediment samples were collected from the eastern edge (mudflat) of the Brandywine Creek adjacent to the Site. Three ash-like samples (including a duplicate) were collected from the eastern bank of the Brandywine Creek, adjacent to the Site. One ash-like sample was collected between 5 to 6 feet bgs from a test pit (TS-TP-01). Four drum content samples were collected from drums observed on site. Sample locations are illustrated on Figure 3, Environmental Sample Location Plan.

Pathways were cut into the Site leading from the dirt access road, located along the Shellpot Branch rail line east of the Site, to the AOC in parcel 19. The pathways were cleared by knocking over the tall phragmites using a front end loader or an excavator. Trees less than 6 inches in diameter were cut down using a chainsaw. The paths were cleared in order for the contractors to gain access to the areas of interest and to set up visual lines for the surveyor to survey the two parcels. Both parcels were surveyed as part of the assessment and the property lines and corners were re-established.

SATA members Paul Davis, Matt Martelli, and Satya Mohanty conducted the field work and sampling. OSCs Mike Towle, Jack Kelly, and Mike Welsh were also on site during different phases of the field activities.

### 3.1 Site Conditions and Observations

Weather conditions on 26 and 27 August were warm, 86°F, and humid, with cloudy skies (rain occurred during the evening). Weather conditions between 30 August and 2 September were cool, 76°F, low humidity, breezy, with partly cloudy skies.

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### 3.2 Test Pit Excavation Activities

Four test pits were excavated within the AOC, located in parcel 19. One test pit, TS-TP-03, was excavated to a depth approximately two feet below the water table, during low tide. Significant yields of groundwater were not encountered in the remaining test pits, due to the silty/clayey soil conditions. The test pits were backfilled to the surface upon completion of each test pit using the excavated material. Test pit 1 had a total depth of 18 feet. Test pit 2 had a total depth of 15 feet. Test pits 3 and 4 had total depths of 9 to 9.5 feet, respectively. A maroon colored silt (possibly fly ash) with rubber hose and wire was found from 0 to 5 feet below ground surface (bgs) in test pit 1, 0 to 8 feet bgs in test pit 2, and 0 to 6 feet bgs in test pits 3 and 4. A white ash-like substance was found from 5 to 6 feet bgs in test pit 1, 8 to 11.5 feet bgs in test pit 2, 3 to 4 feet bgs in test pit 3, and 3 to 5.5 feet bgs in test pit 4. A green and white powdery substance was observed from 9 to 10 feet bgs in test pit 1 and a layer of orange brown cinders/ash was observed from 5.5 to 8 feet bgs in test pit 4. Blackish-gray clayey silt with twig and shell remnants (swamp soils) was underlying the waste/fill material layer in all of the test pits, primarily between 8 and 11.5 feet bgs. Two metal drums containing a brown colored rubber substance and rags with chemical odors was observed in test pit 2.

Eleven exploratory test pits (XTP) were excavated in parcel 19 and three XTPs were excavated in parcel 14. The XTPs were excavated to determine the extent of the fill (maroon colored silt with rubber hoses and metal wire), or if additional buried drums exist in this area. The XTPs were excavated until the natural black organic clay (swamp soil) was encountered. The maroon colored silt fill with rubber hoses and wire was found from 0 to 5 feet bgs in XTPs A, B, and F, from 0 to 4 feet bgs in XTPs C, L, and N, from 0 to 3 feet bgs in XTP-E, from 0 to 2 feet bgs in XTP D, and from 0 to 1 foot bgs in XTP-M. Construction fill consisting of brown silt with rocks was found in XTP-K. Two 55-gallon bung top drums were found during the excavations in XTP-E and XTP-F. The black organic clayey swamp soil was found in XTPs D through J and XTPs L through N ranging at an initial depth of 2 feet bgs to 8 feet bgs. See Attachment 1 for test pit and exploratory test pit logs. See Attachment 4 for the photograph log.

### 3.3 Sampling Activities

During the removal assessment sampling event on 31 August and 1 September, six surface soil samples (including one duplicate) were collected from the AOC located on parcel 19. TS-SS-01 was collected next to an exposed drum located on the creek bank in the northwest section of the AOC. TS-SS-02 was collected from a location determined by the metal detector and photoionization detector readings, located next to the creek bank in the northwestern section of the AOC. TS-SS-03 was collected from a location determined by the metal detector and photoionization detector readings, located in the center of the AOC. TS-SS-04 was collected from a drainage ditch leading from the drum cluster area, in the southern section of the AOC, to the creek. TS-SS-05 was collected next to an exposed drum located in the southern area of the AOC. Three subsurface soil samples were collected from three test pits. TS-SB-01 was collected from test pit 1,

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TS-SB-02 was collected from test pit 2, and TS-SB-03 was collected from test pit 4. The excavator conducting the test pit excavations was utilized to obtain the subsurface soil samples, which were collected directly from the bucket.

Sediment samples were collected from the eastern side (mudflat) of the Brandywine Creek. One sediment sample, TS-SED-01, was collected from the probable point of entry in the southwest section of the AOC (where the drainage ditch discharges into the creek). TS-SED-02 was collected from an area downgradient of the drum cluster area located in the northwest section of the AOC. Both sediment samples were collected during low tide.

One groundwater sample, TS-TP-03-W, was collected from test pit number 3. A peristaltic pump with disposable tubing was utilized to obtain the groundwater sample. The aqueous sample was filtered using a 0.45-micron filter prior to being analyzed by the laboratory. The three other test pits did not yield sufficient amounts of water for chemical analysis, therefore groundwater samples were not collected from these pits.

Laboratory quality assurance and quality control samples were collected. Also, one field blank sample and one rinsate blank sample were collected and analyzed for full scan analyses. See Attachment 2, Sample Log Sheets, for sample descriptions.

All samples were handled and packaged in accordance with the sampling plan. The organic samples were shipped via Federal Express to Severn Trent in Whippany, New Jersey for analysis. The inorganic samples were shipped via Federal Express to Southwest Labs of Oklahoma in Broken Arrow, Oklahoma for analysis. The ash and drum content samples were shipped via Federal Express to Quanterra Inc. located in Pittsburgh, Pennsylvania.

#### 4.0 ANALYTICAL RESULTS

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In groundwater sample TS-TP-03-W, the EPA Region III risk-based concentration (RBC) was exceeded for the following metals: arsenic at 5.2 ug/L (RBC = 0.045 ug/L), iron at 20,800 ug/L (RBC = 1,095 ug/L), and manganese at 882 ug/L (RBC = 73 ug/L) (Reference 9). It should be noted that the aquifer the groundwater samples were collected from is not used for drinking. The comparison is used to evaluate the on-site groundwater with regional standards for protection of human health. See Attachment 3, Sample Data Summary, for the analytical results.

Table 1, Industrial Soil RBC Exceedances, summarizes all of the compounds that exceeded industrial soil RBCs and their location (Reference 9).



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Table 1  
Industrial Soil RBC Exceedances

Chemical	RBC	TS-SS-01	TS-SS-02	TS-SS-03	TS-SS-04	TS-SS-05	TS-FD-01
Arsenic	3.8	33.6 K	48.8 K	117 K	24 K	96.3 K	96.9 K
Iron	61,000	---	---	82,300 J	---	88,800 J	80,900 J
Lead	400	206,000 J	139,000 J	7,460 J	11,100 J	4,590 J	5,630 J
Benzo(a)pyrene	0.78	---	---	---	1	---	---
Chemical	RBC	TS-SB-01	TS-SB-02	TS-SB-03			
Arsenic	3.8	16.2 K	29.4 K	27.8 K			
Lead	400	7,670 J	264,000 J	---			
Iron	61,000	---	---	456,000 J			
Thallium	14	---	---	38.7			

All units are in mg/kg.

J = Analyte present. Reported value may not be accurate or precise.

--- = Not detected.

TS-FD-01 is a field duplicate of sample TS-SS-05.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

Arsenic exceeded its RBC in nine soil samples including one duplicate. There is no RBC for lead in soil. The value of 400 mg/kg was used for comparison purposes and is based on the EPA residential soil screening value. Lead exceeded its screening value in eight soil samples.

The drum content samples and one ash-like material sample (TS-AM-03) were compared to industrial soil RBC values because the sampled material was either found on the ground surface or buried in the ground. Arsenic exceeded its RBC value of 3.8 mg/kg in the following drum content samples: TS-DC-01 (5.1 mg/kg), TS-DC-02 (15.3 mg/kg), TS-DC-04 (19.7 mg/kg), and ash-like material TS-AM-03 (13.1 mg/kg). Lead exceeded its screening value of 400 mg/kg in the following drum content samples: TS-DC-02 (106,000 mg/kg) and TS-DC-04 (3,970 mg/kg) (Reference 9).

Three ash-like material samples (TS-AM-01, TS-AM-02, and its duplicate TS-FD-03) were compared to residential sediment RBC values because the sampled material was found along the creek bank which is used for recreational activities. Arsenic exceeded its RBC value of 4.3 mg/kg in the following ash-like material samples: TS-AM-01 (8.9 mg/kg), TS-AM-02 (26 mg/kg), and TS-FD-03 (26.4 mg/kg). Barium exceeded its RBC value of 5,500 mg/kg in sample TS-AM-02 (6,270 mg/kg) (Reference 9).

In the groundwater sample TS-TP-03-W, the EPA Region III Emergency Removal Guideline (ERG) value (which is derived from the RBCs) was exceeded for the following metals: arsenic at 5.2 ug/L (ERG = 4.5 ug/L), iron at 20,800 ug/L (ERG = 10,950 ug/L), and manganese at 882 ug/L (ERG = 730 ug/L) (Reference 9).

None of the surface soil, subsurface soil, sediment, drum contents, or ash-like material samples exceeded any of the ERG values.

## 5.0 FUTURE ACTIONS/RECOMMENDATIONS

Following a review of the analytical results and consultation with EPA's ecological risk assessment experts, the OSC will determine if any future EPA actions are necessary at the site.

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## 6.0 REFERENCES

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9. U.S. Environmental Protection Agency. 1999. *EPA Region III Risk-Based Concentration Table*. Philadelphia, PA. 7 October.

ATTACHMENTS:    1 – Test Pit Logs and Exploratory Test Pit Logs  
                          2 – Sample Log Sheets  
                          3 – Sample Data Summary  
                          4 – Photograph Log